NIST: projects and activities
Overview of the presentation

NIST
- Information Technology Laboratory
- Information Access Division
- Groups (Speech and Retrieval)
- Projects’ history
- Projects and activities connected with CELCT
About NIST

- Founded in 1901, NIST is a non-regulatory federal agency within the U.S. Department of Commerce.
- NIST has a budget of about $931.5 million
- It employs nearly 3000 people including scientists, engineers, technicians and administrative personnel
- Its headquarters is in Gaithersburg, Maryland and its laboratory in Boulder, Colorado.
NIST’s mission

To promote U.S. innovation and industrial competitiveness by advancing measurement science, standards and technology in ways that enhance security and improve quality of life.
NIST’s Programs

NIST carries out its mission in four cooperative programs:

• the NIST Laboratories, research

• the Baldrige National Quality Program, performance excellence

• the Hollings Manufacturing Extension Partnership, technical and business assistance to smaller manufacturers

• the Technology Innovation Program, awards potentially revolutionary technologies
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NIST’s Laboratories

Director's Office

vacant Director

Patrick D. Gallagher
Deputy Director

Richard Kayser
Chief Scientist

Director
Boulder Laboratories
Richard Kayser, Interim

Chief of Staff
Matthew Heyman

Chief Financial Officer
Todd Grams

Chief Human Capital Officer
Todd Grams, Act.

Chief Facilities Management Officer
Stella Fletys

Technology Innovation Program
Marc Stanley

Baldrige National Quality Program
Harry Hertz

Hollings Manufacturing Extension Partnership
Roger Kilmer

Technology Services
Belinda Collins

Physics Laboratory
Katharina Gembicki

NIST Center for Neutron Research
Robert Dimo, Act.

Materials Science and Engineering Laboratory
Eric Arms, Act.

Manufacturing Engineering Laboratory
Howard Harary, Act.

Information Technology Laboratory
Cita Furlani

Electronics and Electrical Engineering Laboratory
James Othoff, Act.

Building and Fire Research Laboratory
Shyam Sunder

Center for Nanoscale Science and Technology
Robert Celotta

Chemical Science and Technology Laboratory
Willie May

Chief Information Officer
Simon Szykman
Information Technology Laboratory

• Mission supporting U.S. industry, government, and academia by promoting innovation and industrial competitiveness.

• establishes assessment criteria and test data sets for validation of industrial products.
• formulates metrics, tests, and tools for a wide range of subjects.
• provides measurements and standards to advance technologies dealing with access to multimedia and other complex information

• supports technologies used in accessing unstructured, digital multimedia and other complex information, including texts, web pages, images, video, voice and audio
IAD Supported technologies

- Search and retrieval techniques
- Information filtering techniques
- Methods for transforming speech, text, images, and video to representations that can be searched and filtered
- User interaction techniques, including multi-modal approaches, that provide access to information
- Visualization methods that provide access to information
- Sensor data acquisition and management

Supports to generic technologies relevant to information access:

- Speech processing and understanding
- Image and video recognition
- Natural language processing
- 3-D visualization
IAD Mission Statement

"Our mission is to accelerate the development of technologies that allow intuitive, efficient access, manipulation, and exchange of complex information by facilitating the creation of measurement methods and standards."

Contribution to the advancement of these technologies through

- Performance metrics, evaluation methodologies, test suites and test data
- Prototypes and testbeds
- Workshops
- Standards and guidelines
IAD Programs Areas (1)

Biometrics Technology: Identification and Verification Technology

- Patriot Act Research
- Fingerprint Research
- Face Research
- FRVT (Face Recognition Vendor Test)
- FRGC (Face Recognition Grand Challenge)
- ICE (Iris Challenge Evaluation)

Interactive Systems Technology

- Webmetrics
- IUSR (Industry USability Report)
- CIFter (Common Industry Format Testing of usability Evaluation Reports)
- IM (Information Management)
Digital- and Multi-Media Technology

- TREC Video Retrieval
- MPEG/JPEG standards
- MPEG7
- Visualization and Virtual Reality for Manufacturing

Pervasive Computing: SmartSpace Testbed

- SmartSpace
Human Language Technology

- TREC (Text REtrieval Conference)
- DUC (Document Understanding Conferences)
- LVCSR (Large Vocabulary Conversational Speech Recognition)
- Speaker Recognition
- TDT (Topic Detection and Tracking)
- ACE (Automatic Content Extraction)
- Automatic Meeting Transcription Project

- TAC (Text Analysis Conference)
- CLEAR (Classification of Events, Activities and Relationships)
IAD Organization

**Division Office** Accelerates the development of technologies that allow intuitive, efficient access, manipulation, and exchange of complex information by facilitating the creation of measurement methods and standards.

*Contact: M. Herman*

**Speech Group** Contributes to the advancement of the state-of-the-art of spoken language processing (speech recognition and understanding) so that spoken language can reliably serve as an alternative modality for the human-computer interface.

*Contact: J. Garofolo*

**Retrieval Group** Works with industry, academia and other government agencies to promote the use of more effective and efficient techniques for manipulating unstructured textual information.

*Contact: E. Voorhees*

**Image Group** Works to support the technology of image recognition by developing new image recognition methods and developing techniques for the evaluation of existing methods.

*Contact: M. Garris*

**Visualization and Usability Group** Conducts research in visualization and virtual environment technologies in order to demonstrate the utility and feasibility of visual displays of information to industry and government.

*Contact: S. Laskowski*

**Digital Media Group** Works to fosters interoperable access to digital media through the development of metrology and open standards.

*Contact: W. Chang*
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  Contact: W. Chang
The Speech group achieves its goals by:

- Developing measurement methods and algorithms
- Providing annotated corpora for development and evaluation
- Coordinating challenge-task-focused benchmark tests
- Sponsoring evaluation-oriented workshops
- Building testbed systems
Staff

John Garofolo, Group Leader
Kathy Gallo, Secretary
Jon Fiscus
Audrey Le
Alvin Martin, Ph.D.
Kay Peterson
Mark Przybocki
Travis Rose
Greg Sanders, Ph.D.
Craig Greenberg
Martial Michel, Ph.D., Contractor
Jérôme Ajot, Contractor
Mehmet Yilmaz, Contractor
Sherri Condon, Contractor
Paul Herceg, Contractor
Sebastien Bronsart, Guest Researcher
Projects

ACE (Automatic Content Extraction) (1999 - present)
CLEAR (2006 - present)
GALE Translation (2006 - present)
Language Recognition (1996 - present)
Machine Translation (2001 - present)
Metrics for Machine Translation (2008 - present)
Rich Transcription (2003 - present)
Speaker Recognition (1996 - present)
Spoken Term Detection (2006 - present)
TRECVid Event Detection (2008)
Broadcast News Recognition (1996 - 1999)
Conversational Telephone Recognition (1997 - 2001)
IAD Organization

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The Retrieval Group

- Promote techniques for manipulating (largely) unstructured textual information, especially the browsing, searching, and presentation of that information.

Activities (grouped into 4 major areas):

- Encourage retrieval research involving large, unstructured text files by providing test collections and organizing the TREC conference and its proceedings

- Continue to create new test collections, focusing mainly on collections to support specific information retrieval sub-tasks such as cross-language retrieval and multimedia retrieval

- Develop better evaluation methodology for information access, including improved evaluation measures for comparing systems using test collections and new evaluation measures for interactive searching and browsing operations

- Enable faster development of prototype (commercial, academic and government) retrieval systems by distribution of a basic state-of-the-art search engine (the PRISE system)
Staff

Ellen Voorhees, Group Manager
George Awad
Lori Buckland
Hoa Dang
Darrin Dimmick
Rahul Monga
Karolina Owczarzak
Paul Over
Ian Soboroff
Projects

AQUAINT (Answering for Intelligence)
Robust Textual Entailment
Digital Video Test Collection
IRLIB (Information Retrieval Library)
TREC (Text REtrieval Conference)
TAC (Text Analysis Conference)
DUC (Document Understanding Conference)
TIDES (Translingual Information Detection, Extraction, and Summarization)
TRECVID (TREC Video Retrieval Evaluation)
History of campaigns


TREC (1992-present)

MUC (1987-1997)

summarization

- Robust Retrieval
- SPAM Track
- Cross-Language
History of campaigns


TREC (1992-present)

MUC (1987-1997)

CROSS LANGUAGE

- INFORMATION EXTRACTION
  - Named entities
  - Co-reference

FRE

CLEF

NTCIR
History of campaigns

TREC (1992-present)

MUC (1987-1997)
TERN (2004)
ACE (1999-present)

Evolution of MUC
TASKS: -information extraction
- Named entities
- Co-reference

CROSS LANGUAGE

FIRE
CLEF
NTCIR
History of campaigns

- **TIPSTER** (1992-1998)
- **SUMMAC** (1992-1998)
- **TREC** (1992-present)
- **MUC** (1987-1997)
- **TERN** (2004)
- **TAC** (2008-present)
- **DUC** (2001-2007)
- **RTE-PASCAL** (2005-2007)
- **ACE** (1999-present)
- **TREC** (1992-present)
- **CLEF**
- **FIRE**
- **NTCIR**
- **RTE**
- **SUM**
- **RTE**
- **CROSS LANGUAGE**
- **QA**

12 novembre 2008

Leda Casanova
Automatic Content Extraction (ACE)

- was part of an ongoing series of evaluations dedicated to the development of technologies that automatically infer meaning from language data.

- TASKS-08: Local Entity Detection & Recognition
  (6 English - 2 Arabic)
  Local Relation Detection & Recognition
  (2 English - 1 Arabic)
  Global Entity Detection & Recognition
  (7 English - 2 Arabic)
  Global Relation Detection & Recognition
  (2 English - 2 Arabic)
ACE-08 evaluation corpus

• Source data from documents published between 1994 and 2006

• 1 evaluation source set for each language
  – ENGLISH: 11,000 documents from 7 domains (transcripts of broadcast conversation and news, conversational telephone speech, meetings, weblogs)
  – ARABIC: 10,000 documents from 6 domains (almost the same of the ones of English)
Text REtrieval Conference (TREC)

...to encourage research in information retrieval from large text collections.

Overview

Publications

Other Evaluations

Information for Active Participants

Frequently Asked Questions

Tracks

Data

Past TREC Results

Contact Information

12 novembre 2008  Leda Casanova
Text Retrieval Conference (TREC)

- co-sponsored by the NIST and U.S. Department of Defense
- Started in 1992 as part of the Tipster Text program
- purpose to support research within the information retrieval community by providing the infrastructure necessary for large-scale evaluation of text retrieval methodologies.
TREC

• TREC has introduced evaluations for open-domain question answering and content-based retrieval of digital video
• TREC has successfully met its dual goals of improving the state-of-the-art in information retrieval and of facilitating technology transfer
• first large-scale evaluations of the retrieval of non-English (Spanish and Chinese) documents, retrieval of recordings of speech, and retrieval across multiple languages
• test collections and evaluation software are available to the retrieval research community at large
The tracks serve several purposes.

- act as incubators for new research areas: the first running of a track often defines what the problem *really* is, and a track creates the necessary infrastructure (test collections, evaluation methodology, etc.) to support research on its task.

- The tracks also demonstrate the robustness of core retrieval technology in that the same techniques are frequently appropriate for a variety of tasks.

- the tracks make TREC attractive to a broader community by providing tasks that match the research interests of more groups
2008 TREC tracks

- Blog Track
- Enterprise Track
- Legal Track
- Million Query Track
- Relevance Feedback Track
Past TREC tracks

- Cross-Language Track (2002 last run)
- Filtering Track (2002 last run)
- Genomics Track (2007 last run)
- HARD Track (2005 last run)
- Interactive Track (2003 last run)
- Novelty Track (2004 last run)
- Question Answering Track (2007 last run)
- Robust Retrieval Track (2005 last run)
- SPAM Track (2007 last run)
- Terabyte Track (2006 last run)
- Video Track (2001-2002 marginal role, from 2003 independent evaluation with TRECVID)
- Web Track (2004 last run)
TREC Numbers

- **1992 TREC-1** 25 groups
- **1996 TREC-5** 38 groups (from 9 countries)
- **2000 TREC-9** 69 groups (from 17 countries)
- **2001 10° TREC** 87 groups (from 21 countries)
- **2002 11° TREC** 93 groups (from 21 countries)
- **2003 12° TREC** 93 groups (from 22 countries)
- **2004 13° TREC** 103 groups (from 21 countries)
- **2005 14° TREC** 117 groups (from 23 countries)
- **2006 15° TREC** 107 groups (from 17 countries)
- **2007 16° TREC** 95 groups (from 18 countries)
new series of evaluation workshops organized to encourage research in Natural Language Processing and related applications, by providing a large test collection, common evaluation procedures, and a forum for organizations to share their results.

TAC comprises a set of tasks known as "tracks" (each of which focuses on a particular subproblem of NLP) and culminates in a November workshop at NIST in Gaithersburg, Maryland.
TAC 2008 has three tracks:

- Question Answering
- Recognizing Textual Entailment
- Summarization
Track coordinator: Hoa Trang Dang

- The goal of the QA Track is to develop systems that search large document collections and retrieve precise answers to questions (rather than entire documents).

- TREC website has an open archive of TREC QA data and instructions on how to obtain additional detailed Past TREC Results for individual submitted runs.
Track coordinator: Hoa Trang Dang

- The goal of the Summarization Track is to develop systems that produce short, coherent summaries of text.

The 2008 Summarization Track will have two tasks:

- **Update Task**: Piloted in DUC 2007, the update summarization task is to write a short (~100-word) summary of a set of newswire articles, under the assumption that the user has already read a given set of earlier articles.

- **Opinion Pilot**: The pilot task will be to write summaries of opinions from blogs. Participants will be given the questions from the TAC QA Track and the text snippets output by QA systems, and will produce short coherent summaries of the answers to the questions, either from the text snippets themselves, or from the associated documents.
Track coordinators: Danilo Giampiccolo, Hoa Trang Dang

- The goal of the RTE Track is to develop systems that recognize when one piece of text entails another.

- The 2008 RTE Track will include the 3-way classification task piloted in RTE-3.

- The goal of making a three-way decision is to drive systems to make more precise informational.
Publications

- Journal of American Society for Information Science and Technology
- Information Processing and Management
- Computational Linguistics
- Bulletin of the American Society for Information retrieval
- The MIT Press
- Encyclopedia of Computer Science